

IN THE CLAIMS:

1. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film on a substrate and then growing spherical or hemispherical grains on the surface of the semiconductor film;
diffusing an impurity to the grains grown on the surface of the semiconductor film;
removing the impurity product, which is generated in the step of diffusing the impurity, from the surface of the semiconductor film using a non-etching cleaner selected from the group consisting of: 1) hot water, 2) a mixed solution of water, hydrochloric acid and hydrogen peroxide and 3) a mixed solution of sulfuric acid and hydrogen peroxide; and
removing native oxide on the semiconductor film after the step of removing the impurity product.
2. (Original) A semiconductor device as claimed in claim 1, wherein the semiconductor film is formed of a silicon material and phosphorus or arsenic is used as the impurity.
3. (Original) A method of manufacturing a semiconductor device as claimed in claim 1, wherein deionized water is used for the hot water.
4. (Original) A method of manufacturing a semiconductor device as claimed in claim 1, wherein the temperature of the hot water lies within the range of 30° to 80°.
5. (Original) A method of manufacturing a semiconductor device as claimed in claim 1, wherein the semiconductor film which contains the impurity and the grains are formed thereon is used as one of electrodes of a capacitor.
8. (Original) A method of manufacturing a semiconductor device as claimed in claim 7, wherein the native oxide is removed using a mixed solution of hydrofluoric acid and deionized water.

9. (New) A method of manufacturing a semiconductor device as claimed in claim 1, wherein the semiconductor film using a mixed solution of water, hydrochloric acid and hydrogen peroxide has a ratio of 1:1:8.

10. (New) A method of manufacturing a semiconductor device as claimed in claim 1, wherein the semiconductor film using a mixed solution of sulfuric acid and hydrogen peroxide has a ratio of 1:5.

11. (New) A method of manufacturing a semiconductor device as claimed in claim 5, wherein the capacitor is a cylindrical capacitor.